How Do Young Adults Orchestrate Their Multiple Achievement-Related Goals? : Associations of Achievement Goal Orientations With Identity Formation and Goal Appraisals

Flunger, Barbara

2016-10-31

Flunger , B , Marttinen , E , Tuominen-Soini , H & Salmela-Aro , K 2016 , ' How Do Young Adults Orchestrate Their Multiple Achievement-Related Goals? Associations of Achievement Goal Orientations With Identity Formation and Goal Appraisals ' , Research in human development , vol. 13 , no. 4 , pp. 342-362 . https://doi.org/10.1080/15427609.2016.1234309

http://hdl.handle.net/10138/231722
https://doi.org/10.1080/15427609.2016.1234309

Research in Human Development

ISSN: 1542-7609 (Print) 1542-7617 (Online) Journal homepage: http://www.tandfonline.com/loi/hrhd20

How Do Young Adults Orchestrate Their Multiple Achievement-Related Goals? Associations of Achievement Goal Orientations With Identity Formation and Goal Appraisals

Barbara Flunger, Elina Marttinen, Heta Tuominen-Soini & Katariina Salmela-Aro

To cite this article: Barbara Flunger, Elina Marttinen, Heta Tuominen-Soini & Katariina Salmela-Aro (2016) How Do Young Adults Orchestrate Their Multiple Achievement-Related Goals? Associations of Achievement Goal Orientations With Identity Formation and Goal Appraisals, Research in Human Development, 13:4, 342-362, DOI: 10.1080/15427609.2016.1234309

To link to this article: https://doi.org/10.1080/15427609.2016.1234309

Published online: 31 Oct 2016.

Research in Human Development, 13: 342–362, 2016

ISSN: 1542-7609 print / 1542-7617 online
DOI: 10.1080/15427609.2016.1234309

Routledge
Taylor & Francis Group

How Do Young Adults Orchestrate Their Multiple Achievement-Related Goals? Associations of Achievement Goal Orientations With Identity Formation and Goal Appraisals

Barbara Flunger
Utrecht University

Elina Marttinen
University of Jyväskylä

Heta Tuominen-Soini
University of Helsinki

Katariina Salmela-Aro
University of Jyväskylä and Cicero Learning, University of Helsinki

Young adults strive for multiple achievement goals. Frameworks for achievement goal orientations, personal goals, and identity formation have emphasized the role of goal-specific exploration and commitment in the interpretation of goals. However, researchers have yet to combine these different perspectives in an empirical study. Therefore, to explore the processes involved in the selection of multiple goals, the present study investigated the associations of young adults' achievement goal orientations (mastery-intrinsic, mastery-extrinsic, performance-approach, performance-avoidance, and work-avoidance orientations) with distinct styles of exploring and committing to goals, by considering different dimensions of identity formation (commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration) and achievement-related personal goal appraisals (commitment, effort, and progress). Latent change score models were applied to a longitudinal sample of 577 young Finns followed from age 23 to 25 to investigate cross-sectional and longitudinal associations with achievement goal orientations. The analyses revealed significant associations of identification with commitment and exploration in breadth and goal effort with the initial levels of mastery-intrinsic and mastery-extrinsic orientations. Notably, these dimensions of identity formation, goal effort, and mastery goal orientations accentuate motives for self-development and self-improvement. Although the associations were not supported by the longitudinal analyses, it seems fruitful to integrate different theoretical frameworks to further the understanding of the underlying processes in the pursuit of multiple goals.

Address correspondence to Barbara Flunger, Department of Pedagogical and Educational Sciences, Utrecht University, Heidelberglaan 1, 3584 CS Utrecht, Netherlands. E-mail: b.flunger@uu.nl

Young adults find themselves in changing contexts and need to regulate their investments in future plans. Therefore, young adults must continuously adapt their goals. Thus, their commitment to certain achievement-related goals can change: Young adults tend to reflect on their chosen values or goals and might begin to ruminate about whether their selected goals really fit them (Luyckx et al., 2008). This process of self-examination is part of their identity formation (e.g., Schwartz, Zamboanga, Luyckx, Meca, & Ritchie, 2013), for which themes of self-development are prominent issues (e.g., Kaplan & Flum, 2010). If prior goal preferences are incongruent with their identity status, young adults can adjust their development by disengaging from these goals. Thus, the ongoing evaluation of goals might be driven by the identity formation process, which is mainly characterized by two aspects, that is, exploration and commitment (e.g., Marcia, 1966).

Young adults strive for many achievement-related goals (Pintrich, 2000a). Achievement goals (e.g., Dweck, 1986) can be directed toward the aim to develop competence (mastery goals) or to demonstrate competence (performance goals). In addition, mastery and performance goals can be differentiated into additional subcomponents (e.g., Elliot & Harackiewicz, 1996; Niemivirta, 2002) that all operate at the same time. Although these multiple goals may be simultaneously salient, young adults must still prioritize them (e.g., Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Thus, the multiple achievement goals do not necessarily have the same relevance for an individual and, for example, a high preference for mastery-related goals can be coupled with different levels of preferences for performance-related goals (e.g., Tuominen-Soini, Salmela-Aro, & Niemivirta, 2008).

Considering the correspondence of the tendencies toward mastery and self-development, performance, and self-validation (Kaplan & Flum, 2010), achievement goals and identity formation styles have previously been posited to have some similarities. However, empirical studies investigating the association of identity formation dimensions and achievement goal orientations are lacking so far.

Next to their similarities to dimensions of identity formation, achievement goal orientations can also be linked to achievement-related personal goals. Personal goals are evaluated through specific appraisals (cognitions, emotions) and are characterized by the behaviors that people engage in to achieve their goals (e.g., Salmela-Aro, 2010). Self-articulated educational goals may reflect achievement pursuits (Elliot & Sheldon, 1997) and might also translate into achievement goals (see, e.g., Elliot & Sheldon, 1997; Tuominen, Salmela-Aro, Niemivirta, & Vuori, 2004).

In our view, it is fruitful to draw on theories on identity formation (e.g., Marcia, 1966) and frameworks for personal goals (e.g., Nurmi, 2004) to further the understanding of the pursuit of multiple achievement goals. Therefore, the present study investigated the relations of dimensions of young adults' identity formation and appraisals of achievement-related personal goals with their different achievement goal orientations.

Identity Formation

Young adults have the task of forming a personalized sense of identity (Erikson, 1968; Heckhausen, Wrosch, & Schulz, 2010). *Identity formation* can be defined as a self-reflective process that involves reflecting on ideas, convictions, and personal goals (Berzonsky & Barclay, 1981), which serve as representations of the self and identity (Elliot, Chirkov, Kim, & Sheldon, 2001) and offer meaning and structure (Emmons, 1989). Thus, the commitment to and the exploration of personal goals, ideas and values are important for individuals' identity formation (e.g., Marcia, 1966).

Exploration is defined as the extent to which one explores possible and alternative future states; *commitment* refers to the degree to which one selects a certain set of goals and integrates these choices (Marcia, 1966). Marcia (1966) posited a total of four identity formation statuses that are characterized by an interplay of high and low values on the two dimensions of exploration and commitment: identity achievement (high exploration, high commitment), moratorium (high exploration, low commitment), foreclosure (low exploration, high commitment), and diffusion (low exploration, low commitment).

Building on this classification, Luyckx, Goossens, Soenens, and Beyers (2006) proposed the process-oriented dual-cycle model of identity. In this model, identity choices were labeled as commitment making and separated from the aspect of certainty about choices or commitments (which was labeled identification with commitment). Moreover, two forms of exploration were distinguished: exploration in breadth (i.e., exploring alternatives) and exploration in depth (i.e., exploring information about previous commitments to reevaluate their fit with one's own standards). As several findings pointed toward the further distinction of reflective and ruminative components of exploration (e.g., Burwell & Shirk, 2007), a fifth aspect was added (Luyckx et al., 2008), namely, ruminative exploration, a state characterized by indecisiveness and rumination without direction.

The process of identity formation has also been conceptualized from a social-cognitive perspective: Berzonsky (1990, 2003) highlighted three distinct processing styles that reflect the differences in the processes involved in the (re-)construction of a sense of identity: an information-oriented, a normative, and a diffuse-avoidant processing style. An information-oriented style is characterized by the aims of gaining self-insight and learning new things (Berzonsky, 1990, 2003). This orientation can be identified in the statuses of identity achievement or moratorium (Berzonsky & Luyckx, 2008), because both are characterized by an orientation toward autonomy and self-development (e.g., Kaplan & Flum, 2010).

Luyckx and colleagues (Luyckx et al., 2006; Luyckx et al., 2008) tested whether specific patterns in identity formation dimensions could be classified as different identity statuses and found distinct clusters. Achievement was characterized by high levels of commitment making, identification with commitment, exploration in breadth, and exploration in depth (Luyckx et al., 2006; Luyckx et al., 2008). Moratorium was characterized by low scores on commitment making and identification with commitment, high exploration in breadth, and moderate exploration in depth (Luyckx et al., 2006). Thus, an information-oriented processing style might be reflected in particular by a strong reliance on commitment making, identification with commitment, and exploration in breadth.

A normative orientation is characterized by "more automatically internalizing and conforming to prescriptions and expectations of significant others" (Berzonsky & Luyckx, 2008, p. 206). Accordingly, a normative processing style implies that individuals consider the norms and values of others, and their self-evaluation and self-worth depend on whether they feel they have met these norms and values (see Kaplan & Flum, 2010). This orientation is reflected in the status of foreclosure (Berzonsky & Luyckx, 2008).

Foreclosure has been identified by high scores on commitment making and identification with commitment as well as low scores on exploration in breadth and exploration in depth (see Luyckx et al., 2006; Luyckx et al., 2008). Likewise, a normative processing style might be associated with strong commitment making and identification with commitment.

A diffuse-avoidant orientation is characterized by procrastination and the avoidance of goal-directed behaviors and decisional actions (Berzonsky & Luyckx, 2008). As this orientation can be linked to weak commitments and a status of identity diffusion (e.g., Berzonsky, 1990, 2003), this orientation might emerge in particular with the identity formation dimension ruminative exploration. The findings by Luyckx and colleagues (2008) suggest that a diffuse-avoidant processing style might be reflected by high ruminative exploration and low commitment making and identification with commitment.

Achievement-Related Personal Goal Appraisals

Young adults also direct their development by setting personal goals (e.g., Little, 1983). Personal goals are characterized by their specific contents (e.g., family-related, work-related, educational, or other purposes) and the cognitions, emotions, and behaviors that people apply to achieve their goals (Heckhausen et al., 2010; Salmela-Aro, 2009). The goal-specific cognitions, emotions, and behaviors are operationalized as goal appraisals (e.g., Austin & Vancouver, 1996). *Goal appraisals* refer to the commitment attached to a personal goal, the effort individuals exert toward goal accomplishment, and goal-related progress (Austin & Vancouver, 1996; Nurmi, Salmela-Aro, & Aunola, 2009).

Achievement Goal Orientations

Achievement goal orientations describe individuals' general orientations toward learning and studying, the kinds of goals they tend to choose and the kinds of outcomes they prefer in relation to studying (e.g., Niemivirta, 2002). Originally, the research literature on achievement goal orientations focused on two achievement goals, namely, mastery and performance goals (e.g., Nicholls, 1984). Mastery goals are assumed to be directed toward learning and mastering specific contents or tasks, whereas performance goals are assumed to be reflected in concerns and evaluations of ability and performance, in particular when making comparisons with others (e.g., Pintrich, 2000a).

Subsequently, researchers introduced three additional extensions of achievement goal orientations. First, other achievement-related aims were highlighted. In particular, work-avoidance goals that describe the inclination to avoid certain tasks and to avoid effort when working on tasks were introduced (Nicholls, Patashnick, & Nolen, 1985). Further, the tendency to engage in avoidance was integrated into the existing theories on performance goals (e.g., Elliott & McGregor, 2001); that is, performance goals were subdivided into performance-approach and performance-avoidance goals (Elliot & Harackiewicz, 1996). More specifically, it was proposed that performance goals can refer to either the goal of accomplishing normative competence (performance-approach) or the goal of avoiding normative incompetence (performance-avoidance). Finally, regarding mastery goals, a distinction was introduced between mastery-intrinsic and mastery-extrinsic goals. Mastery-intrinsic goals were suggested to be related to the aims of learning the material, improving new skills, and gaining knowledge, whereas mastery-extrinsic goals were suggested to be used to compare achieved competence with external standards, such as grades (see Niemivirta, 2002).

Achievement goal orientations and aspects of identity formation. Identity theory and paradigms on achievement goals have several metatheoretical similarities (Erikson, 1968;

Kaplan & Flum, 2010; Marttinen, Dietrich, & Salmela-Aro, 2016). More specifically, three close correspondences can be identified. First, both paradigms refer to the selection of goals and of self-investments in the means to achieve them. That is, both perspectives stress the ideas that individuals are faced with multiple goals and have to establish their own priorities. Second, both frameworks highlight potential differences between goal strivers who ruminate and avoid goal-oriented decisions, and goal strivers who approach their goals and initiate actions to achieve them. Thus, though not explicitly denoted in the identity theories, both frameworks might entail an approach-avoidance distinction. Third, the tendencies toward either mastery or performance can also be detected in both frameworks. More specifically, a correspondence between the tendencies toward mastery and self-development, or performance and self-validation can be assumed (Kaplan & Flum, 2010). Mastery goals might correspond to an inclination to explore personalized goals that are related to self-development and self-enhancement (Kaplan & Flum, 2010; based on Erikson, 1968). By comparison, performance goals might correspond with concerns about self-worth or self-enhancement (Kaplan & Flum, 2010, p. 61).

Kaplan and Flum (2010) developed a taxonomy for classifying the identity formation dimensions and specific achievement goal orientations. Their classification system considered the paradigm on achievement goal theory that differentiated mastery, performance, and work-avoidance orientations, as well as on Marcia's (1966) classification of the four identity statuses, relying on the three processing styles specified by Berzonsky (1990, 2003; i.e., information-oriented, normative and diffuse-avoidant). In the present study, this categorization was adapted and integrated with the five-dimensional model of identity development (Luyckx et al., 2008). The taxonomy is shown in Table 1.

An information/growth orientation is assumed to be characterized by gathering information about potential goals and their accomplishment, employing reasoned decision making, and demonstrating psychosocial maturity and well-being. Mastery goal orientations were classified as part of this orientation. In Kaplan and Flum's (2010) classification, the identity statuses of achievement and moratorium are categorized as part of this orientation. Considering the five-dimensional model by Luyckx and colleagues (Luyckx et al., 2006; Luyckx et al., 2008) and their findings on identity clusters, strong exploration in breadth, identification with commitment and commitment making were posited to reflect an information/growth orientation.

A normative orientation is understood as having an emphasis on validating the self. Therefore, goals that help to protect self-worth are selected and prioritized. Accordingly, performance goal orientations were classified as part of this orientation (Kaplan & Flum, 2010). Moreover, the identity status of foreclosure can reflect this orientation (Kaplan & Flum, 2010), which could also be identified in strong commitment making and identification with commitment as well as low exploration in breadth and depth (e.g., Luyckx et al., 2008).

A diffuse-avoidant orientation is expected to be characterized by an avoidance of engaging in identity-relevant issues and an avoidance of confronting identity conflicts. Work-avoidance goal orientation was classified as part of this tendency. In the Kaplan and Flum's (2010) classification, the identity status of diffusion was grouped into this orientation, which could also be characterized by high ruminative exploration and low commitment making/identification with commitment (Luyckx et al., 2008).

Achievement goal orientations and achievement-related personal goal appraisals. Frameworks for achievement-related personal goals can be considered to share many theoretical

TABLE 1
Categorizations of Achievement Goal Orientations, Goal Appraisals, and Dimensions of Identity Formation

Categorization	*Information / growth orientation*	*Normative orientation*	*Diffuse-avoidant orientation*
Shared characteristics			
	Gathering information Employing reasoned decision-making Demonstrating psychosocial maturity and well-being	Validating the self Protecting self-worth	Avoiding engaging in identity-relevant issues Avoiding confronting identity conflicts and dilemmas
Achievement-related goals			
Achievement goal orientations	Mastery intrinsic orientation Mastery extrinsic orientation	Performance approach orientation Performance avoidance orientation	Work-avoidance orientation
Goal appraisals	Goal commitment Goal effort Goal progress		
Aspects of identity formation			
Marcia (1966)	Achievement/ Moratorium	Foreclosure	Diffused
Berzonsky (1990, 2003)	Information-oriented style	Normative style	Diffuse-avoidant style
Luyckx et al. (2008)	• Strong exploration in breadth • Strong identification with commitment • Strong commitment making	• Strong commitment making • Strong identification with commitment • Low exploration in breadth and depth	• Low commitment making and identification with commitment • Strong ruminative exploration

Note. The categorization was based on Berzonsky (1990, 2003), Kaplan and Flum (2010), and Luyckx et al. (2008).

similarities with paradigms on achievement goal orientations. Individuals are assumed to select their achievement-related goals by matching their individual aims to the opportunities they have to achieve them (Nurmi, 2004). The selection of specific goals and the behaviors for attaining these goals are highlighted in frameworks for personal goals, which are also central in achievement goal theory (Pintrich, 2000b). Accordingly, it has been suggested that individuals develop an interpretative mind-set for the evaluation of current and future states (see Tuominen-Soini et al., 2008), and this mindset is reflected in their appraisals of certain outcomes of academic engagement (i.e., in their achievement goal orientations), and in their appraisals of engaging in

future achievement-related goals (i.e., in their commitment to these goals and goal-directed behaviors).

Previous findings suggest that this interpretative mind-set might extend to at least two patterns that can be identified in students' differences in achievement goal orientations and appraisals of achievement-related goals: a mastery orientation and an avoidance orientation (Tuominen et al., 2004; Tuominen-Soini et al., 2008). In more detail, mastery orientation was positively associated with goal commitment, goal effort, and goal progress, whereas, in contrast, avoidance orientation was negatively related to goal commitment, goal effort, and goal progress.[1] These findings are also in line with researchers' notions of "positive" and "negative" dimensions of personal goals (see Elliot & Sheldon, 1997), which were based on studies that showed that negative current concerns were associated with low commitment (e.g., Klinger, Barta, & Maxeiner, 1980).

With its distinctive patterns, the two orientations might also be subsumed under the headings of the information/growth orientation and the diffuse-avoidant orientation outlined by Berzonsky (1990, 2003): differences in achievement goal orientations can be assumed between individuals with a high level of commitment and a great deal of willingness to exert effort to reach their personal goals and individuals with low commitment who ruminate rather than exert action for goal attainment.

The Present Study

In the process of setting personal achievement goals, young adults compare and explore their opportunities and make commitments to specific achievement goals. The role of the two decision-making styles *exploration* (e.g., Sheldon, Jose, Kashdan, & Jarden, 2015) and *commitment* (e.g., Sheldon & Elliot, 1999) in the selection of personal goals has been emphasized from different theoretical perspectives: as guiding "mental frames" in the interpretation of achievement goal orientations (Kaplan & Flum, 2010) or as "behavioral markers" of identity formation (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009).

Using Berzonsky's (e.g., 1990, 2003) categorization of three distinct processing styles regarding the development and adjustment of a sense of identity, theoretical connections between achievement goal orientations and identity formation dimensions (Kaplan & Flum, 2010) and between achievement goal orientations and appraisals of individuals' goals can be identified.

The objective of the present study was to investigate the associations of achievement goal orientations with distinct styles of exploring and committing to goals, to explore how young adults select and orchestrate their multiple achievement goals.

To account for the multiplicity of young adults' achievement goal orientations, we assessed mastery-intrinsic and mastery-extrinsic orientation, performance-approach, and performance-avoidance orientation, as well as work-avoidance orientation (Niemivirta, 2002; see also Tuominen-Soini et al., 2008; Tuominen-Soini, Salmela-Aro, & Niemivirta, 2011, 2012). Achievement goal orientations were conceptualized as individuals' general orientations toward learning and studying and operationalized accordingly (i.e., with respect to studying in general

[1] Due to the mixed pattern of results found for performance orientations and goal appraisals (see Tuominen et al., 2004; Tuominen-Soini et al., 2008), performance orientations were omitted from this classification. Based on the findings of Tuominen-Soini and colleagues (2008), positive but rather weak correlations between performance-approach orientation and goal commitment and goal progress could be expected.

and not as domain specific). To capture individuals' identity formation, the five dimensions of identity formation by Luyckx et al. (2008) were studied (i.e., commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration). Goal commitment, goal effort, and goal progress were considered as aspects of individuals' personal goal appraisals (e.g., Austin & Vancouver, 1996).

We investigated three research questions:

1. How are the dimensions of individuals' identity formation associated with their achievement goal orientations? First, we expected to find positive associations of each of three identity formation dimensions (i.e., commitment making, identification with commitment, and exploration in breadth) with mastery-intrinsic and mastery-extrinsic orientation, because these dimensions can be assumed to share an information/growth orientation (see Table 1). Second, we expected positive associations of commitment making/identification with commitment with a performance-approach and performance-avoidance orientation, because we assumed that these relations would reflect a normative orientation. Third, we expected that the identity formation dimension of ruminative exploration would be positively associated with a work-avoidance goal orientation, because both might reflect a diffuse-avoidant orientation.
2. How are individuals' appraisals of their achievement-related goals associated with their achievement goal orientations? We hypothesized to find positive associations of goal commitment, goal effort, and goal progress with mastery (intrinsic and extrinsic) orientations, as goal appraisals and mastery orientations were categorized to share an information/growth orientation, and negative associations with work-avoidance goal orientation. We also investigated the associations of performance orientations with goal appraisals, but as the pattern of results found for performance goal orientation with goal appraisals was ambiguous (Tuominen et al., 2004; Tuominen-Soini et al., 2008), we did not formulate expectations for these associations.
3. Are there associations of the dimensions of identity formation with the achievement goal orientations or the development of achievement goal orientations when goal appraisals are considered at the same time?

To address these three research questions, we investigated concurrent associations, but we were also interested in how the five different dimensions of identity formation and goal appraisals would be associated with the development of achievement goal orientations. In particular, we explored the unique effects of young adults' specific decision-making styles and different goal appraisals on the development of each of their achievement goal orientation by considering all five styles and goal appraisals as predictors. For this purpose, latent change score models were estimated to model the change in young adults' achievement goal orientations.

METHOD

Participants

The study analyzed data from two waves of the ongoing Finnish Educational Transitions (FinEdu) longitudinal study. The study began in 2004 and sampled all 15-year-old students

living in a midsized (population circa 97,000 inhabitants) city in Central Finland in the last year of comprehensive school. The sample can thus be considered representative of young Finns born in 1988 (for more information on the sample, see, e.g., Marttinen et al., 2016). The present study considered the data measured in 2011 (N = 577, participation rate 85%, 322 female, 255 male), when the participants were age 23 years, and 2013/2014 (N = 482, participation rate 86%, 286 female, 196 male), when the participants were age 25. The participants gave their informed consent separately for each wave.

Measures

Identity dimensions. The identity dimensions were assessed with the short version of the Dimensions of Identity Development Scale (DIDS, Luyckx et al., 2008) at the first measurement point. The scale *for commitment making* consisted of two items (e.g., "I know which direction I am going to follow in my life"; α = .86). The scale for identification with commitment comprised two items (e.g., "My future plans give me self-confidence"; α = .87). Exploration in breadth was assessed with a two-item scale (e.g., "I think about different things I might do in the future"; α = .74). The scale for exploration in depth comprised two items (e.g., "I think about whether my future plans match what I really want"; α = .90). Ruminative exploration was assessed with three items (e.g., "I am doubtful about what I really want to achieve in life"; α = 86). The items were rated on a 5-point Likert-type scale ranging from 1 (*completely disagree*) to 5 (*completely agree*).

Goal appraisals. The Personal Project Analysis Inventory (PPA; Little, 1983) was used to measure the achievement-related personal goal assessment. With an open question, the participants were asked to report one education- or career-related personal goal (Salmela-Aro, 2001) at the first measurement point. Subsequently, the participants were asked to appraise this achievement-related goal and specify their goal-directed behaviors (see Austin & Vancouver, 1996). Goal commitment was measured with two items (e.g., "How important is this goal?"; α = .80). *Goal effort* was measured with two questions (e.g., "How much time and effort have you put into this goal?"; α = .92). Goal progress was measured with one item (i.e., "To what extent have you progressed toward achieving this goal?"). The items were rated on a 7-point Likert-type scale ranging from 1 (*not at all*) to 7 (*very much*).

Achievement goal orientations. Five achievement goal orientations were assessed as domain-general orientations toward learning and studying at both time points with an instrument by Niemivirta (2002). Mastery-intrinsic orientation was measured with three items (e.g., "To acquire new knowledge is an important goal for me at studies/work"; α_{T1} = .89, α_{T2} = .91). Mastery-extrinsic orientation was measured with a three-item scale (e.g., "My goal is to succeed at studying/work"; α_{T1} = .85, α_{T2} = .80). Two items from the scale for performance-approach orientation were used (e.g., "An important goal for me at studies/work is to do better than other people"; α_{T1} = .77, α_{T2} = .80). The scale for performance-avoidance orientation consisted of three items (e.g., "I try to avoid situations in which I might fail or make a mistake"; α_{T1} = .83; α_{T2} = .85). The scale for work-avoidance orientation consisted of three items (e.g., "I try to get away with putting forth as little effort as possible in my studies/work"; α_{T1} = .83, α_{T2} = .82). All items were rated on a 7-point Likert-type scale ranging from 1 (*not true at all*) to 7 (*very true*).

Data Analyses

All analyses were conducted with the robust maximum likelihood estimator in Mplus 7.4, which corrects for non-normality in the measures (Muthén & Muthén, 1998–2016).

Preliminary analyses: Longitudinal confirmatory factor analysis. First, preliminary analyses were conducted with longitudinal confirmatory factor analyses to assess the structural stability of the measures of the achievement goal orientations over time. Measurement invariance over time was tested for each achievement goal orientation scale by comparing three nested models with increasing invariance constraints (e.g., Meredith, 1993). The first model tested the factor structure over time (i.e., configural invariance). The second model entailed constrained factor loadings over time (the test of metric invariance). The third model imposed invariant factor loadings and invariant item intercepts over time, testing for strong measurement invariance. The models were evaluated based on Chen (2007) and Cheung and Rensvold's (2002) suggestions. Because the decrease in fit for the more restrictive model was less than .01 for the incremental-fit indices like the Comparative Fit Index (CFI) and the root mean square error of approximation (RMSEA) differed by less than .015, the more restrictive model was preferred. Thus, overall, strong measurement invariance across time was confirmed,[2] and the longitudinal analyses could be meaningfully conducted on the achievement goal orientations.

Development of achievement goal orientations. To examine the change in the achievement goal orientations, we estimated latent change score models (e.g., Hertzog & Nesselroade, 2003). With latent change score models, the change over two time points can be specified through the decomposition of a latent state factor into a latent intercept (i.e., mean initial level of achievement goal orientations) and a latent change factor (i.e., mean change in achievement goal orientations over time; see, e.g., Steyer, Eid, & Schwenkmezger, 1997). A longitudinal latent state model for two time points was specified in a measurement model for each achievement goal orientation, separately. A structural equation model was specified on the basis of the longitudinal latent state model, modeling a latent intercept and a latent change factor (see, e.g., Hertzog & Nesselroade, 2003). The loadings of the first indicators were set to one, and the invariance of the factor loadings over time was modeled for the other indicators. The item intercepts of the first indicator were set to zero, and invariance in the intercepts was modeled for the other indicators, as well as invariance in the residuals for all indicators over time. The residual terms for the two latent state factors were set to zero (Reuter et al., 2010). The means and variances of the latent intercept and change factors were freely estimated (e.g., Reuter et al., 2010).

Analytic strategy. For Research Question 1, the five dimensions of identity formation were considered jointly as predictors of the latent intercept and latent change of each achievement goal orientation in separate analyses (Model 1). Regarding Research Question 2, goal commitment, goal effort, and goal progress were entered as predictors of the latent intercept and latent change of each achievement goal orientation (Model 2). To explore Research Question 3, all five identity formation dimensions and the three goal appraisals were simultaneously considered in one model as predictors of the latent intercept and the latent change factors of the achievement goal orientations (Model 3), in five separate analyses for each achievement goal orientation. We estimated separate structural equation models for each outcome. All predictors

[2] More information on model comparison can be obtained from the first author.

were specified as latent factors. As goal progress was measured with only one item, a latent factor was specified by this item with the loading fixed to 1 and the residual variance to zero.

Handling of missing data. The analyses were applied to a combined data set, with a total sample size of 577 students. All models were estimated with full information maximum likelihood estimation as implemented in Mplus 7.4, which makes use of all available data (Arbuckle, 1996).

RESULTS

The descriptive statistics and correlations of the scales are presented in Table 2.

Inter-relations

The correlations of aspects of identity formation, personal goal appraisals and achievement goal orientations (see Table 2) in the Time 1 data indicated the expected patterns to some degree. The correlations of commitment making, identification with commitment, and exploration in breadth with mastery-intrinsic and -extrinsic orientations were all positive and statistically significant, ranging from .18 to .31. The statistically significant correlations of the goal appraisals with mastery-intrinsic and -extrinsic orientations ranged from .21 to .33. That is, these patterns had the potential to reflect the expected information/growth orientation. The results were less clear for the normative orientation. Contrary to our expectations, there were no significant correlations of commitment making/identification with commitment and performance-approach or -avoidance orientations, but there were significant positive associations with exploration in breadth and exploration in depth (ranging from .12–.25). In addition, ruminative exploration was statistically significantly positively associated with performance-avoidance orientation (r = .23). The correlation of ruminative exploration with work-avoidance orientation was positive and statistically significant (r = .19), pointing to the pattern expected for diffuse-avoidant orientation. There was also a statistically significant positive correlation between work-avoidance orientation and exploration in depth (r = .13).

Longitudinal Associations: Results from Latent Change Score Models

The initial levels and changes in the achievement goal orientations were estimated with latent change score models (e.g., Hertzog & Nesselroade, 2003). The resulting model fit statistics and parameter estimates (means and variances) of the latent intercept and change factors were adequate (see Table 3). These models revealed a significant increase in mastery-extrinsic orientation and a significant decrease in work-avoidance orientation over time (see Table 3). The variance estimates for all latent intercept and latent change factors were significant and indicated interindividual differences in the initial levels but also in the extent of the changes in the achievement goal orientations.

For mastery intrinsic-orientation (CFI = .989; $RMSEA_{range}$ = .024–.043; $SRMR_{range}$ = .024–.033) and mastery-extrinsic orientation (CFI_{range} = .979–.988; $RMSEA_{range}$ = .032–.036; $SRMR_{range}$ = .038–.040), the latent change score models with predictors resulted in a good model fit. The goodness of fit for estimating latent change models with predictors on

TABLE 2
Descriptive Statistics and Intercorrelations of the Constructs Under Study

Dimension	M	SD	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
1. Mastery-intrinsic T1	5.70	1.13	–																
2. Mastery-extrinsic T1	5.64	1.03	.61**	–															
3. Performance-approach T1	3.58	1.54	.16**	.43**	–														
4. Performance-avoidance T1	3.89	1.37	.04	.25**	.34**	–													
5. Work-avoidance T1	3.36	1.40	−.32**	−.33**	.10*	.24**	–												
6. Mastery-intrinsic T2	5.68	1.18	.58**	.36**	.13*	−.01	−.23**	–											
7. Mastery-extrinsic T2	5.83	0.95	.45**	.50**	.19**	.14**	−.24**	.55**	–										
8. Performance-approach T2	3.69	1.61	.08	.26**	.58**	.31**	.02	.17**	.37**	–									
9. Performance-avoidance T2	3.91	1.46	−.03	.08	.18**	.51**	.14	−.03	.14**	.35**	–								
10. Work-avoidance T2	3.09	1.34	−.29**	−.30**	−.00	.11**	.52**	−.39**	−.44**	−.00	.22**	–							
11. CM	3.76	0.89	.18**	.22**	.09	−.07	−.19**	.11*	.05	−.02	−.07	−.13*	–						
12. IC	3.59	0.91	.29**	.31**	.09	−.09	−.23**	.25**	.16**	.00	−.11*	−.16**	.57**	–					
13. EB	3.79	0.95	.28**	.31**	.16*	−.01	−.15**	.30**	.26**	.08	−.01	−.21**	.29**	.37**	–				
14. ED	2.64	1.14	−.08	−.01	.12*	.25**	.13**	.03	.07	.16**	.19	.03	−.39**	−.23**	.04	–			
15. RE	2.50	1.04	−.18	−.12*	.05	.23**	.19**	−.10	−.03	.08	.17	.12*	−.59**	−.42**	−.02	.64**	–		
16. Commitment	6.14	0.93	.33**	.26**	.03	−.01	−.14**	.26**	.20**	−.05	−.03	−.09	.23**	.21**	.25**	−.08	−.20**	–	
17. Effort	4.99	1.37	.32**	.26**	.06	−.00	−.17**	.27**	.22**	−.01	−.05	−.19	.21**	.14**	.20**	−.05	−.14**	.53**	–
18. Progress	4.92	1.44	.28**	.21**	.07	−.07	−.19**	.26**	.15**	−.05	−.09	−.17**	.23**	.22**	.19**	−.11*	−.22**	.47**	.69**

Note. Identity dimension at T1: CM = Commitment making; IC = Identification with commitment EB = Exploration in breadth; ED = Exploration in depth; RE = Ruminative exploration. Goal commitment, effort and progress at T1.

*$p < .05$, **$p < .01$.

TABLE 3
Results of the Latent Change Score Models for the Achievement Goal Orientations

	Model fit indices			*Intercept*		*Change*	
Orientation	*CFI*	*RMSEA*	*SRMR*	M	s^2	M	s^2
Mastery-intrinsic orientation	0.99	0.03	0.06	5.73**	1.19**	–0.03	0.95**
Mastery-extrinsic orientation	0.99	0.03	0.05	5.90**	0.87**	0.18**	0.65**
Performance-approach orientation	1.00	0.02	0.02	3.56**	1.44**	0.07	1.04**
Performance-avoidance orientation	0.94	0.07	0.04	3.64**	1.28**	0.05	1.08**
Work-avoidance orientation	1.00	0.02	0.03	4.12**	1.50**	–0.23**	1.19**

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

performance approach goals (CFI_{range} = .984–.991; $RMSEA_{range}$ = .30–.035; $SRMR_{range}$ = .028–.030) or on performance avoidance goals was again acceptable (CFI_{range} = .973–.980; $RMSEA_{range}$ = .032 – .043; $SRMR_{range}$ = .026 – .034). Regarding the latent change score models for modelling predictors on work-avoidance orientation, the model fits were also acceptable (CFI_{range} = .972 – .977; $RMSEA_{range}$ = .034 – .040; $SRMR_{range}$ = .036 – .038).

Results for Research Question 1: The Associations of Dimensions of Identity Formation With the Achievement Goal Orientations

The results of the analyses exploring the associations of the dimensions of identity formation with the latent intercept and latent change factors for the achievement goal orientations (Model 1) are presented in Table 4. Identification with commitment (β = .19, p = .047) and exploration in breadth (β = .31, $p < .001$) were shown to positively predict the latent intercept of the mastery-intrinsic orientation, adjusting for the other identity formation dimensions. Moreover, exploration in breadth (β = .38, $p < .001$) was shown to positively predict the latent intercept of the mastery-extrinsic orientation while controlling for the other identity formation dimensions. In addition, when controlling for the other identity formation dimensions, commitment making (β = .22, p = .026) and ruminative exploration (β = .31, p = .024) were found to positively predict the latent intercept of the performance-avoidance orientation.

Results for Research Question 2: The Associations of the Goal Appraisals With the Achievement Goal Orientations

The results of the analyses that explored the associations of the goal appraisals with the latent intercept and latent change factors for the achievement goal orientations (Model 2) are presented in Table 5. When analyzing the associations of the goal appraisals with the latent intercept and latent change in achievement goal orientations, goal commitment was found to be positively associated with the latent intercept of the mastery-intrinsic orientation (β = .22, p = .011). The results also revealed a positive association of goal effort with the latent intercept of both mastery-intrinsic (β = .20, p = .021) and mastery-extrinsic orientation (β = .23; p = .019).

TABLE 4
Associations Between the Identity Formation Dimensions and Latent Intercept and Change Factors of Achievement Goal Orientations

	Mastery-Intrinsic Orientation		*Mastery-Extrinsic Orientation*		*Performance-Approach Orientation*		*Performance-Avoidance Orientation*		*Work-Avoidance Orientation*	
Model 1	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)
Effects on the latent intercept factor										
Commitment making	–0.16	(0.10)	–0.06	(0.10)	0.15	(0.10)	0.22 *	(0.10)	–0.06	(0.10)
Identification with commitment	0.19*	(0.10)	0.17	(0.10)	0.01	(0.09)	–0.02	(0.10)	–0.18	(0.10)
Exploration in breadth	0.31***	(0.08)	0.38***	(0.09)	0.10	(0.07)	–0.08	(0.07)	–0.09	(0.08)
Exploration in depth	0.06	(0.08)	0.09	(0.09)	0.18	(0.09)	0.17	(0.10)	0.01	(0.11)
Ruminative exploration	–0.26	(0.13)	–0.20	(0.14)	0.06	(0.14)	0.31 *	(0.14)	0.09	(0.15)
Effects on the latent change factor										
Commitment making	–0.04	(0.13)	–0.18	(0.13)	–0.13	(0.15)	–0.02	(0.14)	0.16	(0.13)
Identification with commitment	–0.02	(0.10)	–0.12	(0.10)	–0.06	(0.11)	–0.11	(0.13)	0.12	(0.14)
Exploration in breadth	–0.02	(0.09)	–0.07	(0.09)	–0.07	(0.08)	0.05	(0.11)	–0.12	(0.09)
Exploration in depth	0.10	(0.11)	0.04	(0.11)	0.02	(0.14)	–0.01	(0.15)	–0.16	(0.15)
Ruminative exploration	–0.01	(0.17)	–0.09	(0.18)	–0.13	(0.18)	–0.15	(0.19)	0.18	(0.19)

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

TABLE 5
Associations Between the Personal Goal Appraisals and Latent Intercept and Change Factors of Achievement Goal Orientations

	Mastery-Intrinsic Orientation		*Mastery-Extrinsic Orientation*		*Performance-Approach Orientation*		*Performance-Avoidance Orientation*		*Work-Avoidance Orientation*	
Model 7	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)
Effects on the latent intercept factor										
Goal commitment	0.22 *	(0.09)	0.16	(0.09)	–0.07	(0.08)	–0.03	(0.09)	–0.14	(0.08)
Goal effort	0.20*	(0.09)	0.23*	(0.10)	0.10	(0.09)	0.13	(0.10)	–0.06	(0.09)
Goal progress	0.02	(0.08)	–0.01	(0.09)	0.02	(0.08)	–0.17	(0.09)	–0.09	(0.08)
Effects on the latent change factor										
Goal commitment	–0.10	(0.09)	–0.04	(0.10)	–0.02	(0.09)	0.05	(0.10)	0.15	(0.10)
Goal effort	–0.06	(0.11)	–0.10	(0.11)	0.00	(0.14)	–0.10	(0.12)	–0.11	(0.13)
Goal progress	0.07	(0.10)	–0.01	(0.11)	–0.16	(0.12)	0.06	(0.09)	0.04	(0.11)

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

Results for Research Question 3: Investigating the Associations in a Joint Analysis

The results of the analyses that considered the identity formation dimensions and goal appraisals simultaneously as predictors of the latent intercept and latent change in achievement goal orientations (Model 3) are presented in Table 6.

TABLE 6
Associations Between the Identity Formation Dimensions, Goal Appraisals, and Latent Intercept and Change Factors of Achievement Goal Orientations

	Mastery-Intrinsic Orientation		*Mastery-Extrinsic Orientation*		*Performance-Approach Orientation*		*Performance-Avoidance Orientation*		*Work-Avoidance Orientation*	
Model 8	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)	*β*	(SE)
Effects on the latent intercept factor										
Commitment making	–0.18	(0.10)	–0.08	(0.10)	0.14	(0.10)	0.22*	(0.10)	–0.06	(0.10)
Identification with commitment	0.21*	(0.09)	0.20*	(0.10)	0.02	(0.09)	–0.02	(0.10)	–0.18	(0.10)
Exploration in breadth	0.23**	(0.09)	0.32***	(0.09)	0.10	(0.08)	–0.10	(0.08)	–0.05	(0.08)
Exploration in depth	0.04	(0.08)	0.08	(0.09)	0.17	(0.09)	0.17	(0.10)	0.03	(0.10)
Ruminative exploration	–0.19	(0.13)	–0.16	(0.14)	0.06	(0.14)	0.31	(0.14)	0.04	(0.14)
Goal commitment	0.11	(0.08)	0.03	(0.08)	–0.09	(0.07)	0.04	(0.08)	–0.07	(0.08)
Goal effort	0.23**	(0.09)	0.23**	(0.09)	0.07	(0.09)	0.09	(0.10)	–0.07	(0.09)
Goal progress	–0.03	(0.08)	–0.06	(0.08)	0.03	(0.08)	–0.10	(0.08)	–0.04	(0.08)
Effects on the latent change factor										
Commitment making	–0.05	(0.13)	–0.18	(0.13)	–0.12	(0.15)	–0.01	(0.14)	0.18	(0.13)
Identification with commitment	–0.03	(0.10)	–0.14	(0.10)	–0.05	(0.11)	–0.11	(0.13)	0.11	(0.14)
Exploration in breadth	0.02	(0.10)	–0.05	(0.10)	–0.04	(0.09)	0.05	(0.10)	–0.14	(0.10)
Exploration in depth	0.09	(0.11)	0.04	(0.12)	0.03	(0.15)	–0.02	(0.14)	–0.16	(0.15)
Ruminative exploration	–0.03	(0.18)	–0.10	(0.19)	–0.16	(0.19)	–0.14	(0.19)	0.21	(0.19)
Goal commitment	–0.08	(0.08)	0.03	(0.09)	–0.01	(0.09)	0.03	(0.10)	0.15	(0.10)
Goal effort	–0.08	(0.12)	–0.10	(0.11)	0.02	(0.14)	–0.10	(0.11)	–0.09	(0.12)
Goal progress	0.09	(0.11)	0.03	(0.11)	–0.16	(0.11)	0.05	(0.10)	0.02	(0.10)

Note. *$p < .05$, **$p < .01$, ***$p < .001$,

When considering all predictors at the same time, identification with commitment was positively associated with the latent intercept of the mastery-intrinsic (β = .21, $p = .023$) and mastery-extrinsic orientations (β = .20, $p = .042$). Exploration in breadth was positively associated with the latent intercept of the mastery-intrinsic (β = .23, $p = .004$) and mastery-extrinsic orientations (β = .32, $p < .001$). Furthermore, goal effort was positively associated with the latent intercept of the mastery-intrinsic (β = .23, $p = .008$) and mastery-extrinsic orientations (β = .23, $p = .008$). Finally, when controlling for all other covariates, commitment making (β = .22, $p = .030$) and ruminative exploration (β = .31, $p = .024$) were positively associated with the latent intercept of the performance-avoidance orientation.

In sum, the findings on the associations of mastery-oriented achievement goal orientations and exploration in breadth, identification with commitment and goal effort could reflect an information/growth orientation.

DISCUSSION

Personal achievement-related goals help individuals to systematize their academic behavior and academic engagement. Therefore, young adults pursue multiple achievement goals. The present

study explored the different ways in which young adults deal with their multiple achievement-related goals. To this end, this research investigated whether different styles of commitment and exploration strategies as well as goal appraisals can serve young adults as a resource for orchestrating multiple kinds of achievement goal orientations. More specifically, we investigated whether five different dimensions of identity formation and three distinct goal appraisals would be found to be associated with achievement goal orientations in a sample of Finnish young adults.

Although individuals are assumed to negotiate their own development by prioritizing goals (e.g., Tomasik, Silbereisen, Lechner, & Wasilewski, 2013), little research has been conducted on how such personal goals are selected (Sheldon, 2014). However, theoretical frameworks for identity formation (Marcia, 1966) and personal goals (e.g., Elliot & Sheldon, 1997) have outlined decision-making processes that underlie the evaluation of goals. In particular, tendencies to engage in exploration/curiosity (e.g., Sheldon et al., 2015) and commitment (e.g., Sheldon & Elliot, 1999) have been emphasized. These serve as "behavioral markers" of identity formation (Luyckx et al., 2009) and are also assumed to be applied in the evaluation of achievement goals (e.g., Kaplan & Flum, 2010). For example, when young adults invest in exploration and self-enhancement to resolve identity-relevant issues, they are likely to show a focus on personal growth and self-development in various domains (such as education), which could be reflected in high mastery goal orientations (Kaplan & Flum, 2010).

The present study took into account different frameworks for identity formation (Luyckx et al., 2008), personal goal appraisals (e.g., Nurmi, 2004), and achievement goal orientations (e.g., Elliott & McGregor, 2001; Pintrich, 2000b), all of which seem to overlap in their elaboration of the processes involved in young adults' selection and evaluation of personal goals. In detail, we drew on previously identified links (see Kaplan & Flum, 2010) between theories describing the processes involved in individuals' identity formation (e.g., Marcia, 1993) and theories on achievement goal orientations (Pintrich, 2000a, 2000b), regarding their shared accentuation of an information/growth, normative or diffuse-avoidant orientation (drawing on Berzonsky, 1990, 2003) in the selection and evaluation of multiple achievement goals. Moreover, we considered theoretical interconnections between frameworks for personal goal appraisals and those for achievement goal orientations (Elliot & Sheldon, 1997; Tuominen-Soini et al., 2008).

In a longitudinal design, the study investigated whether young adults' differential tendencies to commit to personal goals and goal-specific exploration were echoed in their multiple achievement goal orientations. To assess the predictive validity of dimensions of identity formation and goal appraisals, we considered their associations with the development in achievement goal orientations over two years, in addition to exploring concurrent associations.

We proposed that the patterns of associations among dimensions of identity formation, personal goal appraisals, and achievement goal orientations would reflect the three different styles postulated by Berzonsky (1990, 2003). Regarding the concurrent associations that tested for unique associations in joint analyses, these expectations were partly confirmed, namely, for the information/growth orientation.

That is, in the concurrent analyses, young adults' certainty about commitments (i.e., their identification with commitment) and their tendency to explore alternatives (labeled exploration in breadth) had a stronger association with mastery-related achievement goal orientations than the other styles that can be applied when addressing identity-related choices. In addition, goal-specific effort was another central predictor of mastery-related achievement goal orientations. Thus, our results confirmed several of the expected associations, reflecting an information/growth orientation, also

when controlling for other factors. Most noteworthy is that—in line with our expectations—the three constructs with unique predictive effects as well as the respective outcomes (mastery-oriented achievement goal orientations) all entailed motives for self-development and self-improvement. These findings are in line with a recent proposition that some goals might originate from a growth-consistent part of a person (Sheldon, 2014). That is, our findings suggest that individuals who might select and process achievement goals out of an information/growth orientation, based on their identity status, seem to select goals that offer "growth potential" (Sheldon, 2014, p. 2).

Regarding the postulated normative orientation, the findings were ambiguous. When controlling for all other factors under study, the concurrent associations showed that young adults with firm identity choices (operationalized as commitment making) had higher levels of performance-avoidance orientation, or, vice versa, that young adults with lower levels of commitment making might have lower levels of performance-avoidance orientation. This finding could point out that, as expected, strong commitment making can reflect a normative orientation. However, this finding can also indicate that the strength of the commitments of young adults might play a different role in their preferences for performance-approach and -avoidance orientations and that the pursuit of performance-approach goals might be driven by an identity style that differs from the one that drives performance-avoidance goals. The potential differences in decision-making processes with respect to favoring a performance-avoidance rather than a performance-approach orientation were further underscored by the finding that ruminative exploration was positively associated with a performance-avoidance orientation.

We also investigated the associations of young adults' tendencies to engage in exploration, commitment, and goal-specific behaviors with the changes in their achievement goal orientations in longitudinal analyses, considering all predictors in joint analyses. Thereby, we found no significant associations of the distinct forms of exploration, commitment, and goal appraisals with the changes in achievement goal orientations. This might be due in part to our young adult sample, which did not show significant mean changes in three of the five considered achievement goal orientations that we studied.

There are some limitations that should be considered when interpreting the results of our study. First, although the associations of two identity formation styles and goal effort with mastery orientations were shown in comparative tests when considering all predictors simultaneously, these associations were not found in longitudinal analyses. As we had explored the longitudinal associations to assess the predictive validity of the constructs over time, this could mean that these differing findings are less creditable (see, e.g., Sheldon et al., 2015). Yet, the lack of significant longitudinal associations might be attributable to our study design which involved only two measurement occasions. Future longitudinal studies should use a more elaborate longitudinal design, because following young adults over a longer time period and using a larger number of measurement points would allow deeper insight into the development of young adults' identity formation and achievement goal orientations. We investigated changes only in achievement goal orientations, but changes in achievement goal orientations could also have occurred after there were changes in individuals' inclinations to engage in exploration or commitment or in their goal appraisals. In other words, it might be worthwhile for future research to sample young adults over a longer period of time and assess dimensions of identity formation, goal appraisals, and achievement goal orientations at several time points, to explore the interconnections between the constructs in more depth.

Second, this study has limitations with respect to the measurement of identity formation and identity styles. That is, Zimmermann, Lannegrand-Willems, Safont-Mottay, and Cannard (2015) highlighted two facets of exploration in depth: the careful evaluation of existing commitments and the degree to which current commitments are altered (i.e., reconsideration; see Zimmerman et al., 2015). We used a short form of the DIDS (Luyckx et al., 2008), which focused on exploration in depth with reconsideration (see Marttinen et al., 2016). It would be preferable to refer to both aspects of exploration in depth in future studies to obtain a more accurate picture of the processes at play in goal selection. In addition, future research should assess the three identity styles postulated by Berzonsky (1990, 2003) more broadly, for example, by comparing the findings that were produced when the Identity Style Inventory (Berzonsky, 1992) was implemented alongside the DIDS (Luyckx et al., 2008), to analyze all potential associations of identity styles with achievement goal orientations.

Third, this study focused on different guiding themes and orientations that pertained to young adults' goal selection. Future research could also investigate how these processes are related to goal attainment and other outcomes.

Fourth, the generalizability of our findings is limited by our use of only a sample of Finnish young adults. Future studies should investigate the associations of different states of identity development with personal goals in young adults from other nations.

Fifth, to our knowledge, this study is the first to empirically test the correspondences between identity formation dimensions and achievement goal orientations. Future research should test different structural conceptualizations of the associations of identity formation dimensions, personal goal appraisals, and achievement goal orientations. First, future research could explore whether the associations could be integrated into a multifaceted and hierarchical model of decision processes with the three identity styles postulated by Berzonsky (1990, 2003) as higher order factors. Second, this study focused on the unique contribution of specific strategies of exploration and commitment to the evaluation of the differential achievement goal orientations. It might also be worthwhile to explore how specific identity clusters or profiles are associated with goal profiles by applying a person-centered approach.

In sum, this study showed that the integration of different theories that describe the processes involved in young adults' selection and evaluation of their personal and achievement goals can be fruitful, particularly with regard to the associations between their different tendencies toward personal growth.

FUNDING

This research was supported in part by Academy of Finland Grants 139168, 273361, and 273872, awarded to Katariina Salmela-Aro, as well as by Academy of Finland Grant 287170, awarded to Heta Tuominen-Soini. Heta Tuominen-Soini is a postdoctoral fellow in the Pathways to Adulthood Programme.

ORCID

Elina Marttinen http://orcid.org/0000-0003-3099-7174

REFERENCES

Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling* (pp. 243–277). Mahwah, NJ: Erlbaum.

Austin, J., & Vancouver, J. (1996). Goal construction in psychology: Structure, process and content. *Psychological Bulletin*, *120*, 338–375. doi:10.1037/0033-2909.120.3.338

Berzonsky, M. D. (1990). Self-construction over the life-span: A process perspective on identity formation. In G. J. Neimeyer & R. A. Neimeyer (Eds.), *Advances in personal construct theory* (pp. 155–186). Greenwich, CT: JAI Press.

Berzonsky, M. D. (1992). A process perspective on identity and stress management. In G. R. Adams, T. P. Gulluta & R. Montemayor (Eds.), *Social Adolescent identity formation* (pp. 193–215). Newbury Park, CA: Sage.

Berzonsky, M. D. (2003). Identity style and well-being: Does commitment matter? *Identity: An International Journal of Theory and Research*, *3*, 131–142. doi:10.1207/S1532706XID030203

Berzonsky, M. D., & Barclay, C. R. (1981). Formal reasoning and identity formation: A reconceptualization. In J. A. Meacham & N. R. Santilli (Eds.), *Social development in youth: Structure and content* (pp. 64–87). Basel, Switzerland: Karger. doi:0.1159/000401898

Berzonsky, M. D., & Luyckx, K. (2008). Identity styles, self-reflective cognition, and identity processes: A study of adaptive and maladaptive dimensions of self-analysis. *Identity: An International Journal of Theory and Research*, *8*, 205–219. doi:10.1080/15283480802181818

Burwell, R. A., & Shirk, S. R. (2007). Subtypes of rumination in adolescence: Associations between brooding, reflection, depressive symptoms, and coping. *Journal of Clinical Child and Adolescent Psychology*, *36*, 56–65. doi:10.1080/15374410709336568

Chen, F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, *14*, 464–504. doi:10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*, 233–255. doi:10.1207/S15328007SEM0902_5

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, *41*, 1040–1048. doi:10.1037/0003-066X.41.10.1040

Elliot, A. J., Chirkov, V. I., Kim, Y., & Sheldon, K. M. (2001). A cross-cultural analysis of avoidance (relative to approach) personal goals. *Psychological Science*, *12*(6), 505–510. doi:10.1111/1467-9280.00393

Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology*, *70*, 461–475. doi:10.1037/0022-3514.70.3.461

Elliot, A. J., & McGregor, H. (2001). A 2×2 achievement goal framework. *Journal of Personality and Social Psychology*, *80*, 501–519. doi:10.1037/0022-3514.80.3.501

Elliot, A. J., & Sheldon, K. M. (1997). Avoidance achievement motivation: A personal goals analysis. *Journal of Personality and Social Psychology*, *73*, 171–185. doi:10.1037/0022-3514.73.1.171

Emmons, R. (1989). The personal striving approach to personality. In L. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 87–126). Hillsdale, NJ: LEA.

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York, NY: Norton.

Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology*, *94*, 638–645. doi:10.1037/0022-0663.94.3.638

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review*, *117*(1), 32–60. doi:10.1037/a0017668

Hertzog, C., & Nesselroade, J. R. (2003). Assessing psychological change in adulthood: An overview of methodological issues. *Psychology and Aging*, *18*(4), 639–657. doi:10.1037/0882-7974.18.4.639

Kaplan, A., & Flum, H. (2010). Achievement goal orientations and identity formation styles. *Educational Research Review*, *5*(1), 50–67. doi:10.1016/j.edurev.2009.06.004

Klinger, E., Barta, S. G., & Maxeiner, M. E. (1980). Motivational correlates of thought content frequency and commitment. *Journal of Personality and Social Psychology*, *39*(6), 1222–1237. doi:10.1037/h0077724

Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior*, *15*, 273–309. doi:10.1177/0013916583153002

Luyckx, K., Goossens, L., Soenens, B., & Beyers, W. (2006). Unpacking commitment and exploration: Preliminary validation of an integrative model of late adolescent identity formation. *Journal of Adolescence*, *29*(3), 361–378. doi:10.1016/j.adolescence.2005.03.008

Luyckx, K., Schwartz, S. J., Berzonsky, M. D., Soenens, B., Vansteenkiste, M., Smits, I., & Goossens, L. (2008). Capturing ruminative exploration: Extending the four-dimensional model of identity formation in late adolescence. *Journal of Research in Personality*, *42*(1), 58–82. doi:10.1016/j.jrp.2007.04.004

Luyckx, K., Vansteenkiste, M., Goossens, L., & Duriez, B. (2009). Basic need satisfaction and identity formation: Bridging self-determination theory and process-oriented identity research. *Journal of Counseling Psychology*, *56*, 276–288. doi:10.1037/a0015349

Marcia, J. E. (1966). Development and validation of ego identity status. *Journal of Personality and Social Psychology*, *3*, 551–558.

Marttinen, E., Dietrich, J., & Salmela-Aro, K. (2016). Dark shadows of rumination: Finnish young adults' identity profiles, personal goals and concerns. *Journal of Adolescence*, *47*, 185–196. doi:10.1016/j.adolescence.2015.10.024

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, *58*(4), 525–543.

Muthén, L. K., & Muthén, B. O. (1998–2016). *Mplus user's guide* (7th ed). Los Angeles, CA: Muthén & Muthén.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, *91*, 328–346. doi:10.1037/0033-295X.91.3.328

Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology*, *77*, 683–692. doi:10.1037/0022-0663.77.6.683

Niemivirta, M. (2002). Motivation and performance in context: The influence of goal orientations and instructional setting on situational appraisals and task performance. *Psychologia: An International Journal of Psychology in the Orient*, *45*, 250–270. doi:10.2117/psysoc.2002.250

Nurmi, J.-E. (2004). Socialization and self-development. Channeling, selection, adjustment, and reflection. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 85–124). New York, NY: Wiley.

Nurmi, J.-E., Salmela-Aro, K., & Aunola, K. (2009). Personal goal appraisals vary across both individuals and goal contents. *Personality and Individual Differences*, *47*(5), 498–503. doi:10.1016/j.paid.2009.04.028

Pintrich, P. R. (2000a). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, *92*(3), 544–555. doi:10.1037/0022-0663.92.3.544

Pintrich, P. R. (2000b). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation: Theory, research and applications* (pp. 451–502). San Diego, CA: Academic Press.

Reuter, T., Ziegelmann, J. P., Wiedemann, A. U., Geiser, C., Lippke, S., Schüz, B., & Schwarzer, R. (2010). Changes in intentions, planning, and self-efficacy predict changes in behaviors: An application of latent true change modeling. *Journal of Health Psychology*, *15*(6), 935–947. doi:10.1177/1359105309360071

Salmela-Aro, K. (2001). Personal goals during the transition to young adulthood. In J.-E. Nurmi (Ed.), *Navigating through adolescence: European perspectives* (pp. 59–84). New York, NY: Routledge Falmer.

Salmela-Aro, K. (2009). Personal goals and well-being during critical life transitions: The four C's—Channelling, choice, co-agency and compensation. *Advances in Life Course Research*, *14*(1), 63–73. doi:10.1016/j.alcr.2009.03.003

Salmela-Aro, K. (2010). Personal goals and well-being: How do young people navigate their lives? *New Directions for Child and Adolescent Development*, 2010, 13–26. doi:10.1002/cd.278

Schwartz, S. J., Zamboanga, B. L., Luyckx, K., Meca, A., & Ritchie, R. A. (2013). Identity in emerging adulthood reviewing the field and looking forward. *Emerging Adulthood*, *1*(2), 96–113. doi:10.1177/2167696813479781

Sheldon, K. M. (2014). Becoming oneself: The central role of self-concordant goal selection. *Personality and Social Psychology Review*, *18*(4), 349–365. doi:10.1177/1088868314538549

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need-satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, *76*, 482–497. doi:10.1037/0022-3514.76.3.482

Sheldon, K. M., Jose, P. E., Kashdan, T. B., & Jarden, A. (2015). Personality, effective goal-striving, and enhanced well-being comparing 10 candidate personality strengths. *Personality and Social Psychology Bulletin*, *41*(4), 575–585. doi:10.1177/0146167215573211

Steyer, R., Eid, M., & Schwenkmezger, P. (1997). Modeling true intraindividual change: True change as a latent variable. *Methods of Psychological Research Online*, *2*(1), 21–33.

Tomasik, M. J., Silbereisen, R. K., Lechner, C. M., & Wasilewski, J. (2013). Negotiating demands of social change in young and middle-aged adults from Poland. *International Journal of Stress Management*, *20*(3), 222–253. doi:10.1037/a0033935

Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2008). Achievement goal orientations and subjective well-being: A person-centered analysis. *Learning and Instruction*, *18*, 251–266. doi:10.1016/j.learninstruc.2007.05.003

Tuominen, H., Salmela-Aro, K., Niemivirta, M., & Vuori, J. (2004). Adolescents' achievement goal orientations, goal appraisals, and subjective well-being: A person-centered approach. In H. W. Marsh, J. Baumert, G. E. Richards, & U. Trautwein (Eds.), *Proceedings of the Third International Biennial SELF Research Conference: Self-Concept, Motivation and Identity, Where to from here?* Berlin, Germany: Max-Planck-Institut für Bildungsforschung, SELF Research Centre.

Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2011). Stability and change in achievement goal orientations: A person-centered approach. *Contemporary Educational Psychology*, *36*, 82–100. doi:10.1016/j.cedpsych.2010.08.002

Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2012). Achievement goal orientations and academic well-being across the transition to upper secondary education. *Learning and Individual Differences*, *22*, 290–305. doi:10.1016/j.lindif.2012.01.002

Zimmermann, G., Lannegrand-Willems, L., Safont-Mottay, C., & Cannard, C. (2015). Testing new identity models and processes in French-speaking adolescents and emerging adults students. *Journal of Youth and Adolescence*, 44, 127–141. doi:10.1007/s10964-013-0005-7